

Research Article

Clinical Diagnostics of Patients with Acute Purulent Mediastinitis

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Abstract

The objective of the study. To conduct an analysis of clinical diagnosis, symptoms and purulent mediastinal syndromes in patients with acute purulent mediastinitis (APM).

Materials and methods of research. During 2000-2018 there were 65 patients with APM in the thoracic department of the Ivano-Frankivsk Regional Clinical Hospital.

Research results. Clinical picture of APM consists of symptoms of the main disease and local manifestations of purulent process in the mediastinum: chest pain - in 62 (95.4%) patients, infiltrative changes and hyperemia of the thoracic wall were observed in 13 (20%), mediastinal emphysema at 29 (44.6%); general symptoms of endogenous intoxication: increased body temperature in 100% of patients, pallor of the skin in 34 (52.3%), cyanotic changes - in 24 (36.9%), shortness of breath - 37 (56.9%), tachycardia in 100% patients; clinical symptoms of damage to other organs of the mediastinum and chest: upper respiratory tract syndrome in 11 (16.9%), dysphagia in 9 (13.8%), hiccup in 2 (3.1%), hoarseness of voice in 6 (9.2%), cough - 23% (35.4%), exudative pleurisies - 6% (78.4%) and purulent pericarditis - in 18 (27.6%) patients.

Conclusions.

1. Knowledge of the symptoms and syndromes of acute purulent mediastinitis is the basis for timely diagnosis of this disease.
2. A clear clinical interpretation of the symptoms of acute purulent mediastinitis allows suspect this disease already at the initial stages of providing medical care.
3. Early diagnosis of acute purulent mediastinitis is one of the decisive factors in the successful treatment of patients.

Keywords

mediastinitis; diagnosis of mediastinitis; symptoms of mediastinitis

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Problem statement and analysis of the latest research

In modern literature, acute purulent mediastinitis (APM) is considered one of the most severe forms of general surgical infection characterized by aggressive clinical course, rapid development of the syndrome of systemic inflammation response with the phenomena of severe endogenous intoxication, sepsis and multiple organ failure [1, 2].

Purulent mediastinitis – is a disease that occurs in the practice of general, thoracic surgeons, dentists, otolaryngologists, endocrinologists and doctors of other specialties. Extremely high incidence of untimely diagnosis is a significant problem in the treatment of this disease. Thus, the frequency of diagnostic errors in the group of dead patients is 97.4% [2, 3], and in the surviving group - 53.2%. Delay with the operation of patients with APM for one day leads to an increase in lethality 4-10 times [2, 7]. The frequency of medical diagnostic errors with purulent mediastinitis is very high. Thus, the frequency of incorrect diagnoses when the patient receives medical assistance in primary mediastinitis is 87.5%, and in secondary - 100.0% [3]. Even with hospitalization in specialized hospitals, the frequency of invalid diagnoses when admitted is 47.5%

for primary and 40.0% for secondary mediastinitis [1, 5]. The main cause of diagnostic errors in purulent mediastinitis is the lack of knowledge of clinical manifestations of the disease by doctors and diagnostic algorithms. Some authors believe that the possibilities of clinical diagnosis of purulent mediastinitis are negligible, especially in the early stages of the disease [2, 5]. Others believe that clinical data is a point of departure for a diagnostic search and a basis for using paraclinical methods to confirm or deny a likely diagnosis. Untimely diagnosis of purulent mediastinitis is accompanied by numerous complications that pose a direct threat to the life of the patient [1, 6, 7]. Clinical diagnostics of APM presents considerable difficulties, since there are no clear pathognomonic symptoms characteristic of this disease. Particular difficulties arise in the initial stage of development of APM when in the foreground there are general symptoms of purulent process without local manifestations. This is due to the anatomical features of the mediastinum, namely, the depth of placement of abscesses and the separation of mediastinum in the front of the sternum and behind the vertebral column, resulting in local manifestations of purulent process in the mediastinum cannot be detected in the examination of such patients. It is important to deter-

mine the localization and prevalence of purulent process in the mediastinum. For surgeons, the most frequent question is the question of demarcation of the phlegmon's neck (PN) and APM, whether a localized iPNection on the neck or penetrated into the mediastinum? Therefore, knowledge of the symptoms of APM and their clear interpretation is the basis of timely diagnosis of this disease. Only analysis of anamnesis, a set of general and local symptoms of the disease can give the doctor the correct direction for the diagnosis of APM.

The objective of the study. Conduct an analysis of clinical diagnosis, symptoms and purulent mediastinal syndromes in patients with acute purulent mediastinitis

1. Materials and Methods

During 2000-2018 there were 65 patients with APM in the thoracic department of the Ivano-Frankivsk Regional Clinical Hospital, among them were 43 (66.1%) men, 22 (33.9%) women aged 21-76, an average of 36.3 ± 3.9 years.

Of these, the anterior-upper APM was diagnosed in 22 (33.8%), the upper APM was 16 (24.6%), the posterior APM was 8 (12.3%), the total APM was 19 (29.2 %) of patients. Primary APM was 21 (32.3%), secondary - in 44 (67.7%) patients.

The causes of primary APM were: perforation of the esophagus by foreign bodies - 8 (38.1%), patients, spontaneous esophageal rupture - in 7 (33.3%), iatrogenic damage of the esophagus - in 6 (28.6%) patients. PS in the cervical esophagus was detected in 4 (19%) patients, in the middle department - in 7 (33.3%), in the lower esophagus - in 10 (47.6%) patients.

The causes of secondary APM were: odontogenic PN - in 27 (41.5%) patients, tonsilogenic PN - in 23 (35.4%), purulent lymphadenitis - 9 (13.8%), other causes - in 6 (9.2%) of patients.

To solve the tasks in patients with APM, the results of clinical diagnosis of symptoms and purulent syndromes of mediastinal fluid and their secondary signs were analyzed.

2. Results and Discussion

In the clinical picture of APM, only one group of symptoms can be rarely detected, most of which there is a combination of many lesions of the mediastinum and chest, damage to the parenchymal organs, which often leads to an incorrect interpretation of the symptoms and inaccurate diagnosis of APM.

The clinical picture of APM can be divided into several directions. First of all - these are: the symptoms of the underlying disease; local manifestations of purulent process in the mediastinum; general symptoms of endogenous intoxication; clinical symptoms of damage to other organs of the mediastinum and chest; iPNectious-toxic lesions of other organs and systems and complications of APM.

Symptoms of the underlying disease. APM has no clear pathognomonic symptoms characteristic of this disease. Symptom

consists of a set of signs of local purulent-iPNlammatory process in the mediastinum and general symptoms of purulent iPNection. Symptoms caused by the occurrence of APM and are symptoms of APM, which were the cause of purulent process in the mediastinum.

The most common local symptoms of the underlying disease should include chest pain, which is diagnosed in 62 (95.4%) patients. Chest pain occurs gradually with secondary APM and suddenly with perforations of the esophagus or penetrating wounds of the mediastinum. Chest pain is predominantly poured in nature and increases with percussion on the sternum. The localization of pain in the first place depends on the placement and form of APM. So, at the front of the APM, the pain is localized behind the sternum, often pulsating, sometimes without a clear localization throughout the sternum. Mostly, pain in the sternum was observed in patients with posterior APM - in 100% of cases, with superior APM - in 13 (81.2%) and in total APM - in 18 (94.7%) patients. There is an increase in pain in cough, with a displacement of the trachea (symptom of Ruthenburg-Revutsky) [2] - in 47 (72.3%) patients, or when displacing the vascular-nerve bundle of the neck (symptom Ivanov) [1] - in 35 (53.8%) of patients, increased pain during head-to-head enlargement (symptom Gerke) - 34 (52.3%) patients. Intensity of pain in secondary APM in most cases is not significant, but some patients observed severe pain syndrome. The spread of pain was noted in the chest on the side of the defeat, with involvement in the purulent process of the mediastinal and parietal pleura with the subsequent development of pleural empyema. In 23 (35.4%) patients we observed a nausea or acute pain in the area of the heart that arose when iPNiltration of the pericardium into the pericardial cavity with the development of purulent pericarditis.

In the development of posterior APM pain arose in the paravertebral area with irradiation in between the shoulder blade. Pain relief is observed when pressing on the optic processes of the thoracic vertebrae - in 8 (100%) patients, when pushed in the paravertebral area at the level of the 4th thoracic vertebra (symptom of Sauerbach) & shy; - 6 (75%), the symptom of Popov is the appearance of chest pain and back when tapped on the heels of the elongated legs - in 2 (25%), paravertebral symptom of Steinberg - rigidity of long muscles of the back of the reflex nature - in 3 (37.5%) patients.

Pain in primary mediastinitis differed in all intensity of pain syndrome. In the perforation of the esophagus (PE) in 6 (28.6%) patients, the first signs of the disease proceeded asymptomatic, which is due to the lack of significant size of the PS by foreign bodies and the gradual development of APM. In the remaining 15 (71.4%), the clinic began acutely with the appearance of severe back pain, with the intensity of the pain was so significant that even drug analgesics slightly reduced it. Difficulties in diagnosis were due to irradiation of pain in the epigastric area, in the spine, between the shoulder blade, amplified by swallowing and vomiting. The intensity of the pain depended on the massive trauma, the presence of

the rupture of the mediastinal pleura and the development of pneumothorax. The greatest intensity of pain was observed in 7 (100%) patients with spontaneous rupture of the esophagus (Burhave syndrome). The pain arose immediately after the PE with an increase in intensity. In all patients, spontaneous rupture was observed in the lower third of the esophagus, irradiation in the epigastric region with signs of acute abdominal pathology occurred in 5 (71.4%) patients, often leading to inaccurate diagnosis. At the same time, in 2 patients, an erroneous diagnostic laparoscopy was performed with an incorrect interpretation of the clinical symptoms of APM.

At instrumental PE, a sharp pain arose during the manipulation, but with some time there was a slight decrease in the pain syndrome with the subsequent increase due to the progression of APM. At the same time there was an increase in pain during swallowing - in 9 (64.3%) patients and even with insignificant body movements - in 5 (35.7%) patients.

The localization of PT pain directly depended on the location of the perforation. Thus, in the cervical PE, pain was irradiated into the occipital area - in 4 (100%) patients, in the lower jaw - 2 (50%) of patients, increased at the corner of the head - at 4 (100%), while swallowing - at 3 (75%) of patients.

In the damage to the middle part of the esophagus, pain is predominantly spread to the area of the thoracic spine and between the shoulder-bladder area in 6 (85.7%) cases.

It is much more difficult to interpret the pain syndrome in the lower respiratory tract. The pain was predominantly noted in the area of the back 7 (70%), irradiation in the epigastric region - in 5 (50%), distribution of pain in the lower chest - in 4 (40%), and in the area of the heart - in 4 (40%) sick

Local manifestations of purulent process in the mediastinum. Among the main local manifestations of purulent process of mediastinum, we include: iPNiltrative changes of soft tissue of the chest wall, hyperemia of the chest wall, the appearance of mediastinal emphysema, enlargement of the subcutaneous veins of the upper half of the thoracic wall.

iPNiltrative changes and hyperemia of the chest wall were observed in 13 (20%) patients, with upper APM at 9 (40.9%) and in total - in 4 (21%) patients. iPNiltration and hyperemia of the thoracic wall arose in the spread of purulent process from PN to the mediastinum and thoracic wall. iPNiltration of soft tissues of the chest wall was accompanied by necrosis of the skin in this area in 4 (6.2%), iPNiltration zone in the jugular incision - in 7 (53.8%) patients, hyperemia and edema of the anterior surface of the thorax - in 4 (30.7%), supraclavicular area - in 2 (15.4%) patients. A positive symptom of Ravić-Scherbo - the appearance of involvement in the jugular area at a deep insole was diagnosed in 7 (53.8%) patients. In the posterior APM, iPNiltration was noted in 6 (75%) patients in the paravertebral zone.

One of the important symptoms of APM is the appearance of mediastinal emphysema, which was detected in 29 (44.6%) patients. First of all, it is possible to detect mediastinal emphysema in the area of the jugular cutting, which manifested itself in the smoothing of the contours of the jugular cavity and the

sensation of 'crunching snow' in palpation. This symptom was quite pathognomonic for APM. When it was detected and at the appropriate clinic of purulent iPNlammation in the mediastinum, the diagnostic value was 100%. Most often, mediastinal emphysema was detected at primary APM due to perforation of hollow chest organs. Mediastinal emphysema was detected in 18 (85.7%) patients with PE and in 2 (100%) patients with tracheal injuries. At secondary APM, this symptom was detected in 9 (20.5%) patients with the development of gas-forming microflora in the mediastinal fluid.

In 11 (37.9%) patients, mediastinal emphysema spread to the anterior surface of the chest wall, on the neck and face, and predominantly this distribution of hypodermic emphysema was observed in the syndrome and tracheal lesions.

Symptoms of endogenous intoxication are not pathognomonic for APM, often their interpretation not only did not coPNirm the diagnosis, but rather led to the production of non-correct diagnoses, which greatly impeded the timely detection of the main symptoms of APM. The main symptoms of endogenous intoxication with APM were: increased body temperature, pallor or cyanosis of the skin, dyspnea, tachycardia, cold sweat.

Increased body temperature was found in all (100%) patients with APM. A rapid increase in body temperature was observed in patients with PE, where in the background of complete health in the first 6 hours the temperature increased to subfebrile values. In the next 12-24 hours, the temperature rise was up to 38.8 - 39.0 °C. In secondary APM patients had a high temperature before entering the specialized department in connection with the presence of suppurative damage of the neck injury as a primary focus. However, not all patients observed high values of the temperature curve. Thus, in 12 (18.4%) patients, subfebrile rates were observed even with the expanded picture of APM. Extremely high body temperature was observed only in 17 (26.2%) patients. The bulk of patients have a predominantly low incidence of 38 to 39.0 °C.

Pale skin was detected in 34 (52.3%) patients, cyanotic changes in 24 (36.9%), but some patients showed a sharp hyperemia of the face, mainly due to a violation of the venous outflow from the face due to compression of the veins of the neck and mediastinum iPNlammatory iPNiltrates - in 22 (33.8%) patients. In patients who were hospitalized at a late date from the onset of the disease (from 2 to 4 days), the skin color acquired a gray-earth tint - in 19 (29.3%) patients.

Shortness of breath - is not a characteristic symptom of APM and was detected in 37 (56.9%) patients. It can be intoxicated and by the purulent-iPNlammatory changes of the bronchi, which often accompany the APM. Sometimes the cause of shortness of breath was compression of the membranous part of the trachea by iPNlammatory iPNiltrates and, accordingly, narrowing of the lumen of the trachea in the back of the APM, which was detected in 6 (9.2%) patients.

Tachycardia, as a manifestation of general intoxication with APM, was detected in 100% of patients. The pulse rate

averaged 107 ± 9 beats per minute. The level of tachycardia depended on the level of endogenous intoxication, the prevalence of purulent lesion and time from the onset of the disease. In 4 (6.1%) patients who had a severe picture of APM, sepsis and organ failure syndrome observed a marked bradycardia below 50 beats per minute.

Clinical symptoms of lesions of other organs of the mediastinum and chest. The spread of purulent process in the mediastinum often leads to compression by iPNlammatory iPNilrates of the chest cavity, which manifests itself by certain clinical signs that can be suspected of APM. Incorrect interpretation of these clinical symptoms may lead to errors in the diagnosis and, consequently, delay in the surgical treatment of APM.

The syndrome of the upper vena cava was detected in 11 (16.9%) patients. It was manifested as the main source of cyanosis and edema of the face and neck, supraclavicular areas, ear tension, enlargement of the hypodermic veins of the neck and anterior chest wall. Among these patients, cyanosis and edema of the face were detected in 10 (90.9%), edema of the supraclavicular areas – in 7 (63.6%), enlargement of the neck vein and front of the chest – in 6 (54.5%). In the predominantly one-sided purulent process, compression of the right subclavian vein was sometimes observed, which was manifested by edema of the right upper limb - in 4 (36.4%) patients, or in the left ventricular localization of the purulent process in the upper mediastinum there was compression of an unnamed vein - in 3 (27.3%) of the patients, manifested by the swelling of the left upper limb, the left half of the neck and face.

Dysphagia as a symptom of APM was detected in 9 (13.8%) patients. Mostly, dysphagia occurred at the back of the APM as a result of compression of the individual esophagus sections by iPNlammatory iPNilrates. Characteristically, a gradual increase in the dysphagia phenomena with secondary APM in the course of 1 to 2 days from the onset of the disease and rapid – (during 6- 12 hours) in the PE with the development of APM.

One of the rare symptoms of APM was the permanent hiccup, which was diagnosed in 2 (3.1%) patients, due to involvement in the purulent-iPNlammatory process of the diaphragmatic nerve.

Vigilance of voice was found in 6 (9.2%) patients, mainly this symptom arose at secondary APM and PN with involvement in iPNlammation of the epiglottis and vocal cords. However, with primary localization in the upper mediastinum it is possible to engage in the iPNlammation of the pivotal nerves with the subsequent change in voice.

Cough, with APM, was noted in 23 (35.4%) patients. The causes were reflexive irritation of the trachea and bronchi by the iPNlammatory process that spread from the mediastinum to their wall and directly the progression of purulent iPNection in the bronchi and trachea with the development of purulent bronchitis. Reflex cough is more commonly noted at the back of the APM, which arose when compressing the membranous

part of the trachea – in 7 (10.7%) patients. Purulent bronchitis is equally encountered both with back and total APM.

The chest pain appeared in the spread of purulent-iPNlammatory process on the pleural cavity with the involvement of the visceral pleura and compression of the iPNlammatory iPNilrate of the odd and semi-odd vein, which hindered the outflow of blood from the pleural cavity and resulted in the accumulation of fluid in the pleural cavity. The appearance of exudative pleurisy was diagnosed in 51 (78.4%) patients. However, not all patients with exudative pleurisy and empyema have been diagnosed with pain syndrome. Thus, in 9 (13.8%) patients, no pain syndrome was observed even in the presence of fluid in the pleural cavities. The pain of the chest wall on the side of the lesion was noted only in 22 (33.8%) patients, bilateral – in 20 (30.8%) patients.

The pain in the area of the heart was associated with involvement in the pericardial iPNlammation and the development of purulent pericarditis, which was diagnosed in 18 (27.6%) cases. In the development of purulent pericarditis, decreased contractile capacity of the myocardium with a decrease in cardiac output and the development of acute heart failure. The most commonly purulent pericarditis was diagnosed with total APM – in 17 (89.4%) out of 19 patients and in no case was detected with upper APM.

Thus, such a large number of symptoms that arise in the development of APM, creates great difficulties in diagnosing the purulent process of mediastinum. The variety of symptoms and syndromes often leads to a misleading interpretation of them, leading to a misleading diagnosis and subsequently to a delayed execution of surgical intervention that poses a direct threat to the patient's life. Knowledge of symptoms and syndromes of APM is the basis for timely diagnosis of this disease.

3. Conclusions

1. Knowledge of the symptoms and syndromes of acute purulent mediastinitis is the basis for timely diagnosis of this disease.
2. A clear clinical interpretation of the symptoms of acute purulent mediastinitis allows suspect this disease already at the initial stages of providing medical care.
3. Early diagnosis of acute purulent mediastinitis is one of the decisive factors in the successful treatment of patients.

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